Neal, J.: Encephalitis Lethargica, Internat. Clinics, Philadelphia, 1919, vol. clxxxiv.
Netter, A.: L'encephalite lethargique épidémique, Bull. Acad. de méd., Paris, 1918, lxxix, 337; ab., pp. 71–73.
Ordway, M. O.: Boston Med. and Surg. Jour., No. 8, clxxxii, 194.
Pothier, O. L.: Lethargic Encephalitis, Jour. Am. Med. Assn., No. 10, lxxii, 715.
Papin, Denichen and Blanc, C.: Lethargic Encephalitis, Bull. de la Soc. méd. des hôp. de Paris, 1919, xliii, 659.
Patton, J. M.: Ocular Manifestations of Lethargic Encephalitis, Nebraska Med. Jour., 1919, No. 265, vol. iv.
Report of Committee, New York Neurol. Soc. Lethargic Encephalitis, Jour. Nerv. and Ment. Dis., 1919, l, 341.
Russell, W. B.: Acute Encephalitis, Lancet, 1918, ii, 106.
Reilly, T. F.: Sign in Lethargic Encephalitis, Jour. Am. Med. Assn., 1920, lxxiv, 735.
Re, G.: Lethargic Encephalitis, Jour. Am. Med. Assn., December, 1919, xxxv.
Rice-Oxley, A. J.: Epidemic Encephalitis, Lancet, London, July, 1918, ii, 15.
Robinson, C. A.: Lethargic Encephalitis, Indianapolis Med. Jour., 1919, xxii, 163.
Sainton: Encephalite lethargique, Presse méd., 1918, xxvi, 487; ab., 1918, lxxi, 1699.
Skversky: Lethargic Encephalitis in A. E. F., Am. Jour. Med. Sc., 1919, clviii, 849.
Schulze, M.: Encephalitis Lethargica in Pregnancy, Jour. Am. Med. Assn., 1920, lxxiv, p. 733.
Stafford, C. M.: Encephalitis Lethargica, Jour. Lab. and Clin. Med., Detroit, 1919, iv, 691.
Sachs, B.: Epidemic Central or Basal Encephalitis, New York Med. Jour., 1919, cix, 894.
Strauss, I., and Hirschfeld, and Loewe: Etiology of Epidemic Encephalitis, New York Med. Jour., 1919, cix, 772.
Shaw, J. F., and Bartlett, F. H.: Encephalitis Lethargica, Jour. Maine Med. Assn., Portland, 1918, ix, 284.
Tucker, B. R.: Epidemic Encephalitis Lethargica, Jour. Am. Med. Assn., May 17, 1919, p. 1448.
Trautjen: Berl. klin. Wchnschr., 1890, vi, 2.
Tilny and Riley: Epidemic Encephalitis, Neurol. Bull., New York, 1919, ii, 106.
Taylor, E. W.: Polioencephalitis, Boston Med. and Surg. Jour., 1903, p. 634.
Wilson, Kinnier: Epidemic Encephalitis, Brain, London, 1906, Lancet, London, 1918, ii, 91.
Wegefarth, P., and Ayer, J. B.: Encephalitis Lethargica, Jour. Am. Med. Assn., 1919, lxxiii, 12.
Woolley, P. G.: Encephalitis Lethargica, Jour. Lab. and Clin. Med., St. Louis, 1918, iv, 456.
Wiesner, R. R.: Die Etiologie der encephalitis lethargica, Wien. klin. Wchnschr., 1917, xxx, 933.
Vaughn, V. C.: Encephalitis Lethargica, Jour. Lab. and Clin. Med., No. 7, iv, 381.
Vaidya, S. K.: Obscure Epidemic Encephalitis, Lancet, London, September 7, 1918, p. 2322.

A CONSIDERATION OF THE AFTER-CARE OF ARRESTED CASES OF ESSENTIAL EPILEPSY.[1]

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Several years ago I reported a series of arrested or cured cases of essential epilepsies before this Society.[2] The period of arrest

[1] Read before the American Neurological Association, June, 1920.
[2] The Curability of Idiopathic Epilepsy, with a Report of Twenty-nine Cures, Arch. Int. Med., January, 1912.

extended from four to twenty years. I desire at this time to make a few practical comments upon these old cases and add a few notes upon some others, and thus give a proper estimate of the prognostic permanency of an arrest and also to emphasize the importance of a follow-up treatment in all so-called cured cases. There can be little doubt that at least half of the relapses, after apparently more or less enduring arrest, could be prevented by the continued oversight and direction of the after-life of the discharged patient. This principle would not be so difficult to follow were the patients and relatives frankly dealt with regarding the proper mental hygiene which should be employed. The physician's attitude in this respect should not be dissimilar to that assumed in handling tuberculous cases whose active disease process has been brought to an arrest. It may be remembered in my previous report of some thirty cases it was a rather remarkable fact that fully two-thirds of the number reported had a more or less bad heredity. In spite of this handicap none of these cases has relapsed. Neurologists look askance at a good prognosis in such epileptic individuals, yet here another theoretical and tragic view is killed by a fact. Further, neither the length of time the disease had been existent nor the general nature and frequency of attacks played a conspicuous role in estimating beforehand the curable from the incurable. In a review of this entire material one obvious fact, however, not heretofore taken into precise account, was that all the arrested cases did not possess a marked predisposition in makeup, and that soon after coming under a precise training treatment their disease became modifiable by hygienic methods. In none of my arrested cases, as well as those of the literature on the subject, no mere one organ disfunction could have explained the epilepsy or its arrest. The disharmony of the organism as a psychobiologic whole was the great fault, and striving to overcome these special defects while modifying the general life of the individual epileptic was really what brought about a successful arrest.

These general principles are to remedy the innate defects of the constitutional makeup of the epileptic or to so adjust his life that he may find a non-stressful adjustment proportionate to his capacity of adaptation. We are all aware that, as a rule, the epileptic as an individual is incapable of the normal stress life, and even though he ceases to have fits, his epileptic makeup may still be manifested in untranquil moods, states of extreme sensitiveness, anger, petulance and sullenness, so that these less-pronounced epileptic reactions must approximate the normal before we can entertain hopes for any permanency of an arrest of the disease. One invariably finds these slighter indications of the great disorder, which formerly loomed large in the former patient's life, before actual fits recur. These temperamental faults are often not self-generated, but may

be a stress reinvoked by the parents and relatives who, having held themselves in check and being also somewhat similarly temperamentally endowed as the patient himself, may begin to apply too quickly and severely a disciplinary life to the former epileptic patient. A severe type of stressful life is not and can never be thoroughly met. The patient makes a struggle to meet the new demands, but sooner or later succumbs. In searching for the cause one should remember that the physical and mental stress factor is most frequently not immediate to the attack but may be days or weeks precedent to the actual breakdown in seizures.

Two cases of recurrence of attacks after a free interval of years will be briefly cited to illustrate the careful oversight the more permanently arrested cases need if they are to remain free from fits. A clinical study of the cases has been previously reported.[3]

CASE I is now a boy of eighteen years, an only child, born of epileptogenic stock, whose epilepsy developed at eight years. Our patient walked at eighteen months and began talking rather late at two years. He was a crying, difficult baby. He entered public school at seven but did poorly there, being inordinately slow and inattentive, and at the end of two years he was removed on account of "anemia and nervousness." At ten he attended private school, but nervousness and attacks caused his removal.

The first epileptic attack came on after a period of prolonged mental stress in keeping up with his English classes. One morning, while hurrying to get off to catch a train, he complained of dizziness and immediately fell into a severe grand mal attack. Attacks followed this first one at fairly regular intervals of every two or three months until January, 1914, after which he had no attacks for two years. After eighteen months of training treatment, and in the absence of any seizure phenomena, it was decided to allow him to return to public school, which was done for a full-time attendance without the physician's knowledge. He went back to the full-time work with the old dislike, although he was only six months behind the grade of his age. Things would have gone fairly well, perhaps, if he had had some special tutoring or a little more consideration from the teachers, who, it must be said, are often prone to be merciless upon a backward pupil. He was still poor in English and mathematics, and although he would like to have engaged in sports after school, the extra time required for his studies gave him little opportunity. The lack of a full amount of time to play, once not cared for, now became very annoying, and it was often difficult to get him to his meals when out playing. The school work gradually grew more severe; in addition to English and mathematics, in which he stood poorly, he strove to gain a standing in geography, which would enable him to enter the final examinations. An attack finally

[3] Clinical Studies in Epilepsy, Psychiat. Bull., January, 1916–January, 1917.

occurred on December 26, 1915. The school life was again readjusted and there was another long, free interval from attacks (four years).

We have in this boy the makeup in which seizure reactions were induced by a too stressful demand at school. When he was withdrawn from this difficulty and placed in an ideal environment, with a chance to develop spontaneous interests, he became responsive and began to adapt himself fully to a proper physical and mental adolescence. But when he was again thrown into the same difficulties he broke down as he did at first. After having passed a period of four years of arrest he had an attack in December, 1919, which seemed to have been stupidly brought about by the mother's insistence that her only son go to college. To do this he once more went back into the close confinement of a preparatory school in a neighboring city, took up languages and all the studies, at which he did poorly and consequently hated. He stood the application and restraint without protest, but did his work worse and worse, his reaction time increased, he dawdled more and on being pulled up sharply the renewed tension once more broke him into frank epileptic attacks. Often it seems impossible for parents to learn the innate limits of physical and mental capacity in their epileptic children; hence the importance of keeping these arrested cases under medical supervision. This boy is now again doing nicely in an all-year-round training camp; he is no longer required to look forward to a college career, but is taking a practical concrete engineering course.

CASE II is a boy of fourteen years of age whose grand mal epilpesy was in arrest for seven years. He had attacks usually in a series of two to ten, and had at least three or four status periods, in one of which he had 150 grand attacks in a single day. There was no distinct nervous disorder in the family stock, but many of the father's relatives possessed the epileptic character. Our patient was a crying, stubborn child. He attended school for three months, his first trial at five years of age. It was not only difficult for him to apply himself while there, but he was absolutely incorrigible and could not sit still in the classroom. He was very sensitive, and when reprimanded often cried himself to sleep even after the mildest chastisement. He never played any game in which he could not be the leader. While it was possible for him to endure the demands of home life with rages and tantrums, later when these had to be repressed at school he could not subordinate his crude individualistic tendencies. First he grew listless, then more irritable and finally broke into an uncontrollable temper, was punished and sent home. His first grand mal attack came on one night after a particularly exasperating day at school, but he had been steadily growing more irritable and run down for a month before. After the first attack he still continued at school, with all its steadily accumulating

annoyances, until a month later, when he had five grand mal attacks in one night; since that time he has not gone to school. He was allowed to do just as he pleased, to go and come with his father in the fishing boats as he liked. In a few weeks the attacks began to subside, but he still was very irritable; little or nothing seemed to precipitate tantrums and rages, but the latter were not so severe or prolonged. Under training treatment and directing his interests from the abstract work at school to a concrete outdoor life, he gradually became more tranquil and quiet and the attacks ceased.

We now have this boy after an arrest of seven years from his disease once more becoming epileptic. We find the mother anxiously pushing him in the ordinary abstract training at school. He has had three convulsions, the first occurring in November, 1918, the second a year later, and the third in March of this year (1920). There are days when he feels stupid and can do nothing correctly; the parents have learned to put absolutely no duties upon him on those days, either in school or at home: he complains of his head feeling bad and can hardly recall anything that might have transpired during that period, showing a state of acute exhaustion due to forced efforts at school work. In each case it was one of the "dopey" days when the convulsion occurred. These days are from two to four weeks apart, usually caused by some extra excitement or fatigue. He is now five feet ten in height and weighs 143 pounds. He attends public school, and while he is behind most children of his age, he has been promoted each year. He enjoys arithmetic the best of his studies but the past year has become more interested in reading. He is very much interested in anything of a mechanical nature, especially electricity, wireless operating and automobile repairing. During the summer he works for his father around the water and in the fish market, is on regular wages and works very well, but must be watched carefully to see that he does not overdo.

As in Case I, family pride and stupidity seem to be equally responsible here. Parents of epileptic children must learn that even though free from seizures they are capable of withstanding only a certain amount of stress. If they cannot learn this then physicians must continue medical oversight.

Our next case has been in arrest for six years without any relapses to the present time.

CASE III is that of a boy, aged nineteen years, who had petit mal attacks, which he termed "dreamy turns," at eight years of age. He was born of fairly healthy stock. He had no other physical disorder aside from the petit mal and never had any grand attacks. The petit mal occurred as frequently as twenty to thirty a day. He was going to school at the time he came under my care, a few months after the petit mal began. He got along fairly well at school and did not feel particularly fatigued, although he was restless and nervous. He was always quick and impulsive in temperament and

lively and active at play. He was not a diffieult child and took discipline well, although very sensitive. The bromide administration was discontinued, he was placed on a diet and a normal living regimen was established. The dreamy turns gradually became more infrequent, until by twelve years of age they had entirely ceased. He continued his education, went to a boarding academy and made satisfactory progress. He finished his schooling at sixteen and entered an exporting firm, which position he has been in for the past three years. He experiences no sensations at all, and states he can stand all sorts of stress. He eats and sleeps well and rarely gets rushed or fatigued. He is at the present time a tall, well-proportioned youth, and is the picture of health.

In this instance it was possible by tranquillizing the home environment, teaching a mild but consistently regular discipline and the induction of the proper physical regimen to restore this patient to a state of normal health. His present work enables him to gradually increase his hours of responsibility proportionate to that which he is able and desirous of undertaking.

CASE IV.—Our next case is a man of twenty-two years, whose epilepsy has been in arrest for three years. He was born of neurotic parents. At birth he showed an extraordinary supersensitiveness—he started, trembled and cried at the least excitement. His first attack occurred at five years after physical exhaustion and eating indigestible foods, since which time he has had attacks on an average of one or two each year. He learned easily, but his interest in school was so dilatory that his standing was poor. He was so supersensitive that "bad news always made him sick." It would be days before he could get over disappointments. He was very affectionate, conscientious and overprecise about everything, and has always been so from earliest childhood. Four years ago this patient spent several months at Craig Colony, where he kept actively employed, with various mechanical occupations, repairing automobiles, etc. As an illustration of maladjustment the following psychotic episode is so classic as a forerunner to epileptic attacks that this patient's statement may be given here to show his attitude toward his environment:

"Two months ago I noticed that I was getting irritable and dissatisfied. It was difficult to get used to the life here, but I tried hard. I felt suppressed on account of the restrictions, and the daily routine was so trying, but the doctor said it was the right place for me, so I made up my mind I would stay or die. Gradually the feeling became so strong I felt I must get away. I could not bear it any longer. I missed the social life—no dancing or anything. The feeling kept getting worse. If I even spoke to a girl I was reported. One evening another fellow and myself took a walk with two girls and next day I was severely reprimanded. I cannot tell you how I felt that night. I cannot recall any dreams. I thought

that if I could not even take a walk without being called down that I would go home or some place else where I would have some rights. Things kept getting worse, and I though more and more of home and began to write telling how dissatisfied I was with everything. When I get thinking about home and about writing home I always feel depressed, and I am not satisfied until the letter is written. When I had finished a letter to my mother I went to post it and had the attack on the way. I felt tired afterward and did not feel like doing anything. I had been looking forward to having a vacation, but the attack seemed to take the desire away and I began to feel I was not able, and the doctor would say it was foolish to think of going away. So the wanting to go did not seem so strong. After the attack I think I was relieved a little of the extreme irritation—for a time at least. I feel sure, however, that this attack would not have come on if I had had a vacation at the time I wanted it."

After leaving the Colony our patient worked in a garage repairing automobiles, and although he worked hard he seemed to feel quite content to do so. In the fall of 1918 he went to a training camp as a Y. M. C. A. Secretary and stayed there until August, 1919. He then took up salesmanship in a motor car company and continues in this field. He is out in the open air a great deal, is interested in his work and feels that he has entirely recovered from his epilepsy. He has been free from attacks for over three years.

One often hears the inquiry, Do epileptics themselves really gain an insight into the nature of their disorder and their innate temperament? A propos of this I may extract a paragraph from this former patient's letter:

"I always look back with gratitude to the time my eyes were really opened to the nature of my disease and the kind of individual that I am. In addition to paying proper attention to the routine of living I keep myself properly and interestingly employed. I take no sedatives or laxatives, and am in good physical trim. I know full well that my victory over my disease has been brought about by my learning about myself. I suppose I shall always have to refrain from certain stresses and things of an irritating nature."

Unfortunately not merely insight but reëducation is necessary before an epileptic individual may be permanently helped. This latter case underwent a training treatment of three years before the desired results were obtained.

CASE V.—The final case may be briefly cited of a man, now thirty-five years old, who has been free from grand mal attacks for over ten years. The grandfather and father were both epileptic. Our patient had been for ten years an epileptic, when a general training plan of treatment was undertaken. He is a college-trained agriculturalist and now owns and operates a large grain and fruit farm. He was married several years ago after a vasectomy. In the absence

of a family of his own he has adopted several children and is living a contented and happy life. He is so sure of his poise and tranquillity of mind that he contemplates having the function of the vasectomy restored, but the possibility of the transmissibility of so strong a heredity is a factor which must be given serious consideration.

We may conclude that: (1) So-called cures or arrests in essential epilepsies are brought about only by the most thorough-going and prolonged plan of neurologic and hygienic training treatment in which reëducation is the basic factor. (2) That relapses in arrested cases occur through negligence or disregard of the essential factors. There is renewed and intensive physical and mental stress and that proper and appropriate medical supervision should be continued throughout the lives of such individuals. Such a plan of after-care in private and institutional practice would greatly diminish the possibilities of relapses. (3) That a more or less enduring arrest and cure in essential epilepsy may be considered permanent when the environment and life reactions as regards the secondary epileptic reactions are approximately normal. That no mere cessation of epileptic fits under sedatives should be held out as an enduring arrest unless the individual shows a corresponding absence of epileptic reactions of all sorts.

VIRULENT DIPHTHERIA BACILLI CARRIED BY CATS.[1]

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The available literature dealing with the transmission of diphtheria from cats to human beings is not convincing, due chiefly to the fact that the bacteriologic studies and reports are incomplete. However, many instances are on record which apparently show a relationship between animal and human infections, based upon clinical observations alone.

Thirty years ago Klein[2] described lesions in cats which he considered typical of natural infections with diphtheria bacilli. Low,[3] in 1888, reported the occurrence of four cases of diphtheria in one house, which he thought had been carried by a pet cat from another case in the same neighborhood. Cultures from this cat contained

[1] Published with permission of the Surgeon-General, U. S. Army, who is not responsible for any opinion expressed or conclusions reached herein.
[2] Local Government Board Report (Gr. B.), 1889, pp. 162–174.
[3] Ibid., 1888, xviii, 131.